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21	NORTHERN DISTRICT OF CALIFORNIA		
22	SAN FRANCISCO DIVISION		
23	ORACLE AMERICA, INC.	Case No. CV 10-03561 WHA	
24	Plaintiff,	DECLARATION OF STEVEN M. SHUGAN IN SUPPORT OF ORACLE	
25	v.	AMERICA, INC.'S REPLY TO GOOGLE	
26	GOOGLE, INC.	INC.'S OPPOSITION TO MOTION TO EXCLUDE PORTIONS OF THE EXPERT REPORTS OF GREGORY K. LEONARD AND ALAN J. COX	
27	Defendant.		
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I, STEVEN M. SHUGAN, declare as follows:

- I have been retained as an expert in this matter and conducted a study using conjoint analysis to evaluate the enhancements enabled by the use of the copyrights and patents that Google is alleged to have infringed. In this declaration, I address certain aspects of the Declaration of Dr. Gregory K. Leonard as it related to my conjoint analysis.
- My background and qualifications are set forth in my Declaration in Support of Oracle's Motion to Exclude Portions of the Expert Reports of Gregory K. Leonard and Alan J. Cox (Dkt. No. 560 at 2–4), and I incorporate them here by reference.
- 3. In addition to the qualifications described in my initial declaration, I have graduate training in economics (a doctorate in Managerial Economics), and I taught econometrics at the University of Chicago, where I was listed on the econometrics faculty at the time. In any event, the most relevant expertise to my analysis is marketing, not economics.
- As in his original Expert Report, Dr. Leonard's declaration attempts to dismiss a widely used field of research because of the potential for measurement inaccuracies or bias. He has not demonstrated that such biases are present in my study, he has not considered that my results are entirely consistent with actual market shares for the devices being considered – which shows a high degree of external validity, and he relies on obscure and misquoted literature to support his positions.
- 5. Having reviewed Dr. Leonard's declaration, I remain of the opinion that he lacks familiarity with the accepted principles, methodologies, and literature that are relevant to conjoint analysis. Dr. Leonard's declaration suggests that he has surveyed a largely irrelevant body of literature, in search of sound bites that would seem, when presented out of context to jury who are likely unfamiliar with survey methodology, to support some of the opinions he expresses. The declaration suffers from the same principal defect as Dr. Leonard's report: he is reading the wrong articles about the wrong survey techniques and then citing them for propositions that are wrong, or at best, irrelevant. Dr. Leonard's declaration does not demonstrate the expertise necessary to critique the 2011 Smartphone Survey in particular or conjoint analysis in general.

Dr. Leonard does not have relevant experience in marketing.

Given the application that I and ultimately Professor Cockburn used, the relevant literature 6.

for evaluating my time-tested market research methodology is the marketing literature. Dr. Leonard has not indicated that he has expertise in marketing. Based on the literature mentioned in his declaration, Dr. Leonard's experience appears to be in surveys in which people are asked what they have done or bought in the past; therefore, it appears that he does not have a background in the type of surveys done in market research.

7. Dr. Leonard suggests he has experience with choice-based methods by noting that he co-authored a paper with Daniel McFadden. Although Professor McFadden uses choice-based methods, the paper he co-authored with Dr. Leonard does not employ such methods. Also of note, one of McFadden's best known papers is "The Choice Theory Approach to Market Research" in which he examines conjoint analysis and makes no mention of hypothetical bias.¹

Dr. Leonard's fight over terminology is irrelevant and misplaced.

- 8. Dr. Leonard engages in a discussion of terminology over multiple pages, starting at ¶17. His remarks regarding the definition of revealed and stated preferences could have been avoided had Dr. Leonard refrained from quoting me out of context in his rebuttal report. Dr. Leonard wrote: "First, Professor Shugan claims that "Dr. Leonard describes my study as a 'stated preference' study and criticizes it on that basis. That characterization is misleading . . ." (Leonard Decl. at 5.) But my discussion of "stated preference" is based on an "understanding of that term in the marketing literature," as I clearly stated in ¶20, in the very same sentence of my Declaration that Dr. Leonard quoted above. (Shugan Decl. at 7.) I have noted in my Reply Report and my first Declaration that Dr. Leonard's critiques relied on a variety of articles on simple stated preference methods that do not rely on choice-making exercises, such as the one in the 2011 Smartphone Survey, which formed the basis for my opinions here.
- 9. Consequently, a large fraction of the literature authored and cited by Dr. Leonard (in both his report and much of his declaration) is irrelevant because it does not address how I used a conjoint analysis to form my expert opinion. For example, the paper by Dr. Leonard and Professor McFadden

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McFadden, Daniel, "The Choice Theory Approach to Market Research," *Marketing Science*, Vol 5. No. 4, Special Issue on Consumer Choice Models, Autumn 1986, pp. 275-297.

focuses on contingent valuation and Willingness to Pay ("WTP").² The only mention of conjoint analysis in that paper is a reference to an early version of conjoint: the authors state that "a constellation of techniques called *conjoint analysis* elicits consumer rankings or ratings of hypothetical products." This particular methodology is not what was used in my choice-based conjoint method, and thus it offers no relevant insight on choice-based conjoint analysis. In the same vein, Dr. Leonard's coauthorship with Professor Diamond does not contribute to the methodology that I used in my Expert Report as it again refers to contingent valuation techniques and not to choice-making exercises.⁴

10. Notably, these two chapters that Dr. Leonard co-authored and quoted from are chosen without regard to a chapter by Kemp and Maxwell in the same book, who state: "The most significant advance in survey research methods over the last 25 years has been the development of trade-off analysis techniques, the best-known form of which is called conjoint measurement."

<u>Dr. Leonard continues to misread the literature to conjure up a problem with</u> "hypothetical bias."

11. Dr. Leonard quotes in part from articles in obscure journals and articles from outside the marketing literature to make the case that my survey is "susceptible to hypothetical bias." He presents numerous articles that either (1) do not apply to conjoint analysis or (2) focus on the economic construct of WTP, which is not a relevant measure in my Expert Report. Dr. Leonard himself acknowledges that WTP and pricing decisions are not relevant to my survey: "Moreover, Dr. Shugan fails to note that he and Dr. Cockburn are using his conjoint survey results for a purpose much different than the making of 'pricing decisions,' which is what Miller, et al. (2011) discuss. Dr. Shugan and Dr.

⁶ Leonard Decl. at 7.

McFadden, Daniel, and Gregory Leonard, "Issues In The Contingent Valuation Of Environmental Goods: Methodologies For Data Collection And Analysis," in Hausman, Jerry A., Ed., Contingent Valuation: A Critical Assessment, North Holland Press, Amsterdam, 1993, pp. 165-215.

McFadden, Daniel, and Gregory Leonard, "Issues In The Contingent Valuation Of Environmental Goods: Methodologies For Data Collection And Analysis," in Hausman, Jerry A., Ed., Contingent Valuation: A Critical Assessment, North Holland Press, Amsterdam, 1993, p. 165-215.

Diamond, Peter A., Jerry A. Hausman, Gregory K. Leonard, and Mike A. Denning, "Does Contingent Valuation Measure Preferences? Experimental Evidence," in Hausman, Jerry A., Ed., Contingent Valuation: A Critical Assessment, North Holland Press, Amsterdam, 1993, p. 41-89.

Kemp, Michael A., and Christopher Maxwell, "Exploring a Budget Context for Contingent Valuation Estimates," in Hausman, Jerry A., Ed., Contingent Valuation: A Critical Assessment, North Holland Press, Amsterdam, 1993, p. 224.

Cockburn are attempting to predict changes in market share resulting from a change in a product attribute." (Leonard Decl. at 19.) If Dr. Leonard acknowledges this application, then it is unclear why he relies so heavily on this and other papers which primarily discuss WTP. Furthermore, many of these articles discuss WTP as it applies to situations completely unrelated to the case in this matter, my use of conjoint analysis, or the proper application of conjoint analysis as more widely applied in market research.

- 12. Below I present examples of how Dr. Leonard continues to misread the literature to conjure up a problem with "hypothetical bias." These examples demonstrate how Dr. Leonard cites literature to make allegations that are not applicable to my Expert Report and conjoint analyses.
 - Ladenburg, J., S. B. Olsen, R. C. F. Nielsen, "Reducing hypothetical bias in Choice Experiments Testing an Opt-Out reminder," European Association of Environmental and Resource Economists 15th Annual Conference, Thessaloniki, Greece, 2007. This citation is irrelevant to my analyses. The authors use a survey employing simple (not conjoint) "choice experiments on preferences for re-establishing a stream in a park in Copenhagen." Dr. Leonard also quotes a slide titled "No hypothetical bias panacea," on which the authors note that "...the challenge remains of finding a hypothetical valuation design that demonstrably provides unbiased value estimates for public goods." As I previously emphasized, valuation methods for public goods such as a park cannot be applied to those evaluating consumer goods such as cell phones. Hence, this article does not support Dr. Leonard's assertions.
 - Silva, Andres, Rodolfo M. Nayga, Jr., Ben L. Campbell, and John Park, "On the Use of Valuation Mechanisms to Measure Consumers' Willingness to Pay for Novel Products: A Comparison of Hypothetical and Non-Hypothetical Values," International Food and Agribusiness Management Review, Vol. 10, No. 2, 2007, pp. 165–180. This source (which is not even included in the Institute for Scientific Information ("ISI") journal citation reports of accepted journals) suggests that hypothetical bias may affect estimated WTP, but makes no reference to an effect on preference shares, and is therefore not relevant to Dr. Leonard's critiques. Meanwhile, Silva does acknowledge the wide application of conjoint analysis and acknowledges that the approach that I took in this case is more practical than alternative approaches.
 - Volckner, Franziska, "An empirical comparison of methods for measuring consumers' willingness to pay," Marketing Letters, Vol. 17, 2006, pp. 137–149. As the title of this article indicates, it is irrelevant to the analyses I conduct or the conclusions that I or Professor Cockburn draw from my 2011 Smartphone Survey. Again, while this source provides support that hypothetical bias may affect estimated WTP it does not address the effect of particular features on preference shares. The authors conclude: "Our research contributes to the body of academic literature that investigates techniques for measuring reservation prices by empirically analyzing two potential sources of differences among WTP estimates that emerge from value elicitation studies."
 - Harrison, Glenn P. and E. Elisabet Rutström, Experimental Evidence on the Existence of Hypothetical Bias in Value Elicitation Methods, Handbook of Experimental Economic

Results, Volume 1, Elsevier, 2008. The cited chapter in this book does not discuss conjoint analysis and the final conclusions of the paper are unrelated to the conjoint analysis employed in this case. This source examines hypothetical bias as it relates to WTP in contingent valuation studies, which is a different methodology than the one in my 2011 Smartphone Survey.

- Bettman, James R., Mary Frances Luce, and John W. Payne, "Constructive Consumer Choice Processes," Journal of Consumer Research, Vol. 25, No. 3, 1998, pp. 187–217. This source does not refer to conjoint analysis or choice-based methods and is irrelevant to the statistical modeling approach that I have employed in my Expert Report. This article states the consumers in the real world also exhibit biases and, in fact, the biases found in market research studies can reflect the actual biases consumers have in the real market. The authors of this well known behavioral theory publication explain how consumers construct preference under certain circumstances.
- Miller, Klaus M., Reto Hofstetter, Harley Krohmer, and Z. John Zhang, "How Should Consumers' Willingness to Pay Be Measured? An Empirical Comparison of State-of-the-Art Approaches," Journal of Marketing Research, 2011, pp. 172–184. As I state in my Reply Report, Miller et al. indicates that opposite of Dr. Leonard's claims and finds that hypothetical bias cannot necessarily be assumed: "Our mean bias analysis uses the criterion of overlapping confidence intervals and cannot confirm the existence of a hypothetical bias. This result suggests that in our data set, all methods have a high convergent validity in measuring consumers' mean WTP [willingness to pay]." The authors also conducted t-tests that indicate the existence of hypothetical bias for a cleaning product. However, even if such hypothetical bias had occurred in my study, its only influence would have been on willingness to pay.
- Murphy, James J., P. Geoffrey Allen, Thomas H. Stevens, and Darryl Weatherhead, "A Meta-Analysis of Hypothetical Bias in Stated Preference Valuation," Environmental and Resource Economics, Vol. 30, No. 3, 2005, pp. 313–325. Dr. Leonard quotes selections from the Murphy et al. article (which again is evaluating environmental/public goods) and ignores this article's support for choice-based conjoint. He ignores that the authors "... find that a choice-based elicitation mechanism is important in reducing bias." Hence this article does not support Dr. Leonard's assertions.
- 13. Dr. Leonard also includes two Sawtooth Conference papers to demonstrate in ¶27 and ¶28 of his Declaration that hypothetical bias is not a new phenomenon, but a widely discussed issue that needs to be accounted for in validity measures. However, both of these papers simply discuss limitations for direct measures of external validity of conjoint studies; they do not refer to hypothetical bias at all. It is obvious that Dr. Leonard again misstates the literature. Dr. Leonard quotes "use of CBC [Choice-Based-Conjoint] share-of preference estimates should in general not be taken as forecasts of the market shares without adjustment of the external effects." (Leonard Decl. at 12.) However, my preference share calculation correspond almost perfectly to current market shares of the leading operating system brands and therefore do not need any calibration or adjustment. In fact, one of the

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papers cited by Dr. Leonard confirms this approach: "CBC is often concerned with the prediction of market shares. In this context, the external validity of CBC can be defined as the accuracy with which a CBC market simulator predicts these real market shares." Hence this paper does not support Dr. Leonard's assertions, but instead merely emphasizes that it is important to do the types of conjoint validation that I did in this matter. My results confirm that the results of my 2011 Smartphone Study simulate the preferences observed in the real world.

- 14. Many real-life practitioners are not concerned about hypothetical bias. Notably, the Department of Justice ("DOJ") advocates choice-based surveys without mentioning hypothetical bias. For example, see Case 1:11-cv-00948-BAH, Document 67-2, filed 08/24/11, GX 622, Designing and Using Surveys to Define Relevant Markets by Christine Meyer. In fact, Dr. Leonard discusses one application (with no mention of hypothetical bias) in his article "Application Of Empirical Methods In Merger Analysis." Hence, Dr. Leonard seems to grudgingly admit that DOJ and some economists are turning to marketing research tools such as conjoint to solve problems that could not be solved by traditional economic tools.
- 15. Finally, Dr. Leonard claims that hypothetical biases will artificially elevate the WTP upwards. There is no support to suggest that the results of the 2011 Smartphone Survey are affected by hypothetical bias. Dr. Leonard's critiques regarding hypothetical bias would appear to apply to all market research tools employing consumer surveys. Thus, although he acknowledges in his recent Declaration that hypothetical bias is not necessarily present (Leonard Decl. at 19), Dr. Leonard provides no evidence that the conjoint analysis that I employed has a specific flaw or defect. Further, one could confirm that hypothetical bias is not an issue with my study by simply increasing the prices in my simulation model and comparing the preference share shifts under this scenario with my original analyses.

Dr. Leonard ignores my results regarding price, and he miscasts my use of the 2011 **Smartphone Study data**

16. Dr. Leonard claims that the main consequence of hypothetical bias is for the price feature to be underestimated in its importance, but he ignores my results, where price was the second most important feature in my conjoint analysis. However, even if the results of my estimation model would

have understated the importance of price, the market simulation analysis that I conducted in my Expert Report only considers scenarios where the levels for patented features change, not levels of price. (See Exhibit 3A of my Expert Report). Hence, market share movements depend solely on the relative relationships between product features that have nothing to with WTP, price, or any monetary unit. Indeed, Miller et al., cited by Dr. Leonard, state that while choice-based-conjoint *may* lead to a higher stated willingness to pay, "hypothetical CBC can be appropriate if a manager is interested mostly in the relative partworths of product attributes and price." In addition, any "missing attributes" in my conjoint analysis would be equivalent in the "but-for world" and "infringing world." Hence, the missing attributes have no impact on consumer choices between the two worlds. Thus, any potential bias will not influence the market share measures that I presented or that Professor Cockburn relied on.

17. Dr. Leonard continues to rely heavily on an article by Professor Ding et al. (quoted in both his report and again in his Declaration) that discusses the type of features that might be affected by hypothetical bias. He mischaracterizes this article attacking conjoint. In fact, this article is supporting conjoint and only trying to propose an improvement to conjoint to make consumers more sensitive to product prices. However, completely contrary to Dr. Leonard's claims, in this article, Professor Ding points out that features that are highly utilized are typically undervalued. Application launch time would be such a feature, as it is unlikely to be the focus of Smartphone users' experiences, but it is used every time that any application is used. Dr. Leonard argues that I am using "conjecture" to predict how a hypothetical bias would affect the features being considered, but that is hypocritical because Dr. Leonard is relying on Ding's research and of course Professor Ding is using exactly the same conjecture to draw his conclusions. Thus, Dr. Leonard is simultaneously dismissing Professor Ding's analysis and conclusions by asserting that conjecture is inappropriate in such settings, yet citing Professor Ding to critique me. One must ask why Dr. Leonard is willing to cite Professor Ding at all if such conjecture – based on economic theory and market research – is irrelevant.

18. Finally, Dr. Leonard continues to cite selectively and omit context-changing information.

Miller, Klaus M., Reto Hofstetter, Harley Krohmer, and Z. John Zhang, "How Should Consumers' Willingness to Pay Be Measured? An Empirical Comparison of State-of-the-Art Approaches," *Journal of Marketing Research*, Vol. 48, No. 1, 2011, pp. 172–184 at p. 178.

241–254 at p. 243. Kenneth E. Train, Discrete Choice with Simulation, Cambridge University Press, 2009, p. 156 (emphasis added).

It is unacceptable in the academic world to take a quote out of context, which he did in the List and Gallet paper where he excludes a crucial phrase (exclusion in italics):

"Exceptions to this upward bias can be found in numerous studies (e.g., Sinden 1988; Johannesson et al. 1998), but the average person seems to exaggerate his or her actual WTP across a broad spectrum of goods with vastly different experimental protocol."

19. As I noted in my Reply Report and Declaration, Dr. Leonard seems to dismiss conjoint methodology broadly (which Dr. Leonard denies in his recent Declaration). He continually cites Train who generally recommends the use of market data (such as that also considered by Professor Cockburn). However, even Train acknowledges that market data are not always the ideal method to parse out valuations and that under some circumstances market data can lead to insufficient utility measurements from price: "Even for choice situations that currently exist, **there may be insufficient variation in relevant factors to allow estimation with revealed-preference data**." Train explains that insufficient variation in price leads to the unrealistically small importance of price, such that the researcher could erroneously conclude from this insignificance that price is unimportant to consumers. This paradox is inherent in revealed-preference data (i.e., use of market data): factors that are the most important to consumers will often exhibit the least variation due to the natural forces of market equilibrium. Their importance might therefore be difficult to detect with revealed-preference data. Hence, my conjoint approach is the best approach for the assignment in this case.

Dr. Leonard dismisses the conjoint simply because it did not confirm his own assumptions.

20. As discussed in my Declaration and Reply Report, the price preferences respondents exhibited in the 2011 Smartphone Survey <u>are not</u> inconsistent with the real world behavior of some or many consumers, even if they do contradict classical normative axiomatic economic theory about how everyone should theoretically behave. As I previously noted, and is widely recognized in the literature, individuals often use price as more than merely a budget constraint. For example, a higher price for some individuals might provide prestige for a conspicuously consumed product like a smart phone or

List, John A. and Craig A. Gallet, "What Experimental Protocol Influence Disparities Between Actual and Hypothetical Stated Values?" *Environmental and Resource Economics*, 20, 2001, pp.

provide a signal of a non-observable durability. So, consumers may interpret price (and perhaps the brand name) more broadly or differently than Dr. Leonard wants them to. ¹⁰ Hence, if so-called economic preferences as described by Dr. Leonard don't hold in the survey results, then it is a reflection of real-world consumer behavior. In real markets, a few consumers can make decisions that might appear to contradict economic predictions just as they can in a survey.

- 21. Dr. Leonard claims that preferences should be monotonic, that is, a price of \$200 is always preferred to a price of \$300, a price of \$100 is always preferred to a price of \$300, and a price of \$100 is always preferred to a price of \$200. However, his monotonicity rules fail to account for phone buyers such as the ones I already described in my Reply Report. Again, as I discussed in my Reply Report, I could have imposed monotonicity constraints on the model; however, as pointed out in the paper cited by Dr. Leonard, market share predictions should refrain from such constraints: "On the other hand, if the primary purpose of the study is to predict aggregate measures such as market shares, monotonicity constraints appear less helpful, and may occasionally even be harmful." Nevertheless, as I noted in my Reply Report, the application of such constraints would yield even higher damages.
- 22. Dr. Leonard places excessive emphasis on individual responses and claims that results are inconsistent with economic preferences. Furthermore, he ignores the underlying power and purpose of conjoint accuracy, which comes from predictions at the market level (e.g., market shares). Most economic models focus only on evaluating and predicting market level measures as there is an inherent randomness in predicting individual choices in both surveys and real world decisions. Similar to the "Law of Large Numbers," the aggregate level provides precise estimates because individual errors tend to cancel out. This is why larger samples produce better estimators for population values even though larger samples often have outliers that may initially appear problematic (but they are not). For example, it is impossible to predict one coin toss (heads or tails have equal probability) but 100 coin tosses will be much close to 50 heads and 50 tails than 2 heads and 98 tails.

For example, see Kahneman, Daniel et al., "Economic Preferences or Attitude Expressions?: An Analysis of Dollar Responses to Public Issues," *Journal of Risk and Uncertainty*, Vol. 19., No. 1-3, 1999, pp. 203-235.

Johnson, Richard M., "Monotonicity Constraints in Choice-Based Conjoint with Hierarchical Bayes," Sawtooth Software Research Paper Series, 2000, p. 9.

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1	I declare under penalty of perjury that the foregoing is true and correct and that this
2	declaration was executed at Gainesville, Florida on November 1, 2011.
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5	By: Steven M Shughon
6	By: STEVEN M. SHUGAN
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GENERAL ORDER 45 ATTESTATION I, Steven C. Holtzman, am the ECF User whose ID and password are being used to file this document. In compliance with General Order 45, X.B., I hereby attest that Steven M. Shugan has concurred in this filing. Dated: November 1, 2011 BOIES, SCHILLER & FLEXNER LLP By: <u>/s/ Steven C. Holtzman</u> Steven C. Holtzman Attorneys for Plaintiff ORACLE AMERICA, INC.